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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,935	03/01/2002	Shunpei Yamazaki	740756-2447	8560

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EXAMINER	
BAUMEISTER, BRADLEY W	

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/084,935	YAMAZAKI ET AL.
	Examiner	Art Unit
	B. William Baumeister	2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang '075.

a. Zhang teaches recrystallized Si-TFTS having a CVD sputtered barrier layer 2 and gate oxide layer 5 which are both composed of the same materials and by the same methods (col. 5, lines 10-25), and an Al metal gate electrode (col. 5, lines 34, 35).

b. The oxide layers include a halogen such as F or Cl (e.g., col. 7, lines 13-; col. 8, lines 9-26) that is added at a concentration of greater than 0.1 atom % (claim 14) and less than 20% (col. 9, lines 55-68). A halogen concentration of 1 volume % corresponds to 2e20 cm^-3 (col. 9, lines 60-65) which is less than the 5e20 concentration set forth in claim 1 and greater than the 1e17 concentration of claim 5. The oxide also includes C at a concentration of 5e18 cm^-3 (col. 10, lines 60-64).

c. Regarding various dependent claims, such as 9 and 10, the following case law makes clear that in claims directed towards a product, it is the patentability of the final product per se which must be determined, no matter how actually made. Further, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or otherwise. In re Hirao, 190 USPQ 15 at l 7 (footnote 3). See also, In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 16l; In re Wethheim, 191 USPQ 90

(209 USPQ 554 does not deal with this issue); In re Marosi et al., 218 USPQ 289; and particularly In re Thorpe, 227 USPQ 964. Note that in such cases, the burden is on applicant to prove that claim language relating to the method of making the device results in a structural difference over the prior art.

Thus, none of these dependent claims setting forth the halogen carrier gas further distinguishes the invention over any prior art which possesses the same structure, as claimed.

d. Applicant previously argued (1) that the claims require that the insulating layer have some positive carbon impurity level; but (2) that none of the prior art references disclose that the insulating film have a carbon, much less one that is less than the claimed concentration of 5e19 (e.g., claim 1) or 1e 18 (e.g., claim 4). The examiner continues to accept applicant's statement that the claims require some carbon to be present in the insulating layer, and therefore the claims are so limited to preclude reading on carbon-free insulating films. However, the argument that the prior art does not disclose such carbon-impurity-possessing insulating films is not persuasive for two reasons.

i. First, the examiner agrees that the portion of Zhang relied upon at col. 19, lines 60-, refers to the semiconductor layer as opposed to the insulating layer. Nonetheless this disclosure is relevant because Zhang further discloses that when the semiconductor film is obtained through plasma CVD, natural oxidation occurs at the surface (e.g., col. 10, lines 47-59). As such, this oxidized portion of the C:Si film includes C impurities. Since the Si film itself has a C concentration of 5e18, the carbon concentration in this region is necessarily below 5e19 (per claim

1) and at some point in the thickness direction, the C concentration necessarily decreases to below 1e18 (per claim 4).

ii. Second, Zhang discloses that the halogen (F or Cl) may be included using various carrier gasses including CCl4 or fleon [sic: Freon]: a fluorocarbon gas (e.g., col. 8, lines 9-14). As such, when either of these carrier gases are employed the resulting insulating layer will necessarily also possess trace levels of C.

iii. Accordingly, for either of these two reasons, the examiner maintains the previous position that the prior art discloses the presence of carbon impurities in the insulating film.

3. Claims 1-34 are rejected under 35 U.S.C. 102(b) as being anticipated by JP '679, or in the alternative, under 35 U.S.C. l03(a) as obvious over JP '679 in view of JP '267.

a. These two Japanese patent documents correspond to the Japanese patent applications to which Zhang et al. '075 claims foreign priority.

b. JP '679 appears to disclose all of the same information relating to the oxides containing halogen and carbon impurities. (See e.g., page 5 upper-left column disclosing a halogen concentration of less than 20% and preferably within the range of 0.2 to 10%, and that 1% corresponds to 1-2e20 cm/t3. Also, page 3, lower right column discusses the use of CCl4 gas.) As such, the claims are anticipated under the same rationale as set forth above in relation to Zhang '075, which also serves as an English translation of JP '679.

c. Alternatively, in case all of the information relied upon is not, in fact, contained exclusively within JP '679, the claims are alternatively rejected over JP '679 in view of JP '267—the other foreign priority document. The references would have been obvious to combine for the purpose of producing a TFT with improved properties and their teachings would be combinable as evidenced by the fact that they both serve as the basis for the single Zhang patent.

Response to Arguments

4. Applicant's arguments filed 8/25/04 have been fully considered but they are not persuasive.

a. Regarding the examiner's position repeated in paragraph 2.d.1 hereinabove, Applicant argues that the examiner is merely speculating that the oxidized portion of the silicon film would possess C. However, the examiner's position is not based on mere speculation. Rather, the examiner's position is based upon the fact C is present in the Si, and Zhang expressly states that natural oxidation occurs at the surface of the film. Or restated, the surface portion of the C-doped Si is converted to C-doped SiOx. Applicant has not provided any basis, explanation or evidence for the contrary assertion that oxidation removes **all** of the carbon from the surface portion of the C-doped Si.

b. Applicant further argues that even if C is present, the natural oxide film would not be "on an insulating surface" as claimed. This argument is not persuasive because the claims do not require that the C-doped insulating film be **directly** on the insulating surface.

c. Regarding the second basis for the rejection repeated in paragraph 2.d.ii hereinabove, Applicant argues that the examiner has failed to make a *prima facie* case of anticipation because the examiner has failed to show that the use of the halogen containing gas would necessarily result in an insulating film having the claimed concentration of halogen. The examiner notes that the claims' open-ended ranges set forth only an upper halogen limit, but do not set forth any lower limits; as such, the claims read on an insulating layer having any trace amount of the claimed halogens. As applicant acknowledges, the examiner's position was—and is—that some trace amount of halogen will necessarily remain in the resultant insulating film when the halogen-containing gas is employed because well-accepted physics principles dictate that it would be impossible to remove absolutely all of the halogen contaminants. As such, the examiner has, in fact, established a *prima face* case of inherency, and therefore of anticipation. As the burden has shifted to Applicant to rebut this *prima facie* showing of anticipation, and Applicant has not produced any evidence whatsoever to the contrary.

d. Applicant's arguments to the 103 rejections are the same as those set forth in relation to the 102 rejections (that the references do not teach all of the limitations), and do not add any further arguments.

e. As such, for the reasons set forth previously and hereinabove, the rejections are still deemed to be proper and are therefore maintained.

Conclusion

5. All claims are drawn to the same invention claimed in the parent application prior to the filing of this Request for Continued Examination under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing under 37 CFR 1.114. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to B. William Baumeister whose telephone number is (571) 272-1722. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BRADLEY BAUMEISTER
PRIMARY EXAMINER

B. William Baumeister
Primary Examiner
Art Unit 2815

September 7, 2004